IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	:	**Confirmation No. 3298**
Masanori WADA et al.	:	Attorney Docket No. 2006_0184A
Serial No. 10/568,283	:	Group Art Unit 2874
Filed September 14, 2006	:	Examiner Omar R. Rojas
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REQUEST FOR RECONSIDERATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Office Action of March 18, 2008, the period for response to which having been extended by two months to August 18, 2008, reconsideration of the rejections contained in the Office Action is respectfully requested.

In the Office Action, the Examiner rejected claims 1, 4 and 6 as being unpatentable over Zheng, US Pat. No. 6,246,813 in view of Morooka et al. (Morooka), JP 2003-222764). Claims 2, 3, 5-7 and 9-20 were rejected in further view of Saito et al., JP 2003/149502. Claim 8 was rejected in further view of Nakamura. However, the references that have been cited by the Examiner do not properly disclose or provide any reason for their combination in a manner so as to result in the present invention.

The Present Invention

As was discussed in the prior response, an object of the present invention is to provide an optical receptacle capable of maintaining high precision and reliability while having a small size with a small number of components and requiring a low production cost. In the optical receptacle according to the invention, a precision sleeve 12 or 22, for example, has a stub 14, for

example, provided with an optical fiber fixed to one end of an inner hole of the precision sleeve through an adhesive 16. A sleeve holder is fixed to an outer periphery of the precision sleeve by press-fitting or through an adhesive, noting elements 13 and 23 in Figs. 1A and 1B, for example.

An outer periphery of the stub and/or the inner hole of the precision sleeve has a surface roughness (Ra) value of 0.1 μm or more and 0.5 μm or less. With this limitation, an adhesive that is used to fix the stub to one end of an inner hole of the precision sleeve spreads uniformly across an outer periphery of the stub because of the surface properties with the above surface roughness limitation. Because of the uniform distribution, the stub is positioned and centered in the precision sleeve through self alignment. The stub is held stably and accurately at the center of the precision sleeve through the layer of adhesive having a uniform thickness. Note the discussion in the specification at page 13, lines 4-14, for example. Increasing the surface roughness Ra value of the outer periphery of the stub and the inner hole of the position sleeve to more than 0.5 μm could significantly increase the Ry value (maximum roughness).

Independent claim 1 recites that the stub is fixed only to an inner hole of the precision sleeve, the stub being fixed to the inner hole of the precision sleeve through an adhesive. Noting for example Figs. 1A and 1B, it can be seen that the stub 14 is fixed at one end of the precision sleeve 12 or 22. There are no other parts to which the stub is fixed. This emphasizes the fact that the self alignment that takes place between the stub and the precision sleeve, through the use of the adhesive in combination with the surface roughness limitation, is one that takes place between these two elements. No other elements are involved for the self alignment aspect.

The Newly Cited Patent to Zheng

Zheng is now primarily cited by the Examiner as having a pigtail stub 130 fixed only to an inner hole of a precision sleeve 140 through an adhesive 150 and a sleeve holder 145.

Zheng relates to an optical collimator. As shown in Fig. 3A, and described in column 4, lines 22-51, a GRIN lens 105 is inserted into and held by a first short glass tube 110. Then a dual fiber pigtail 130 is inserted onto and held by a second short glass tube 115. The GRIN lens 105 and the fiber pigtail 130 held by the first and second glass tubes 110 and 115 are mounted on an

alignment stage (not illustrated in the patent). The distance and orientation of the fiber pigtail 130 relative to the GRIN lens 105 are then aligned and adjusted until the lowest transmission loss from the input fiber 20 to output fiber 125 is achieved.

After the fiber pigtail 130 is placed at its optimal position relative to the GRIN lens 105, the positions of the two glass tubes 110 and 115 are sledded to the center until the end surfaces of the first and the second short glass tubes are in contact. After they are in contact, a 353ND epoxy 135 is applied to the interface areas between the first and second short glass tubes 110 and 115. The 353ND epoxy 135 is also applied at the interface areas between the GRIN lens 105 and the first short glass tube 110 and the interface areas between the second short glass tube 115 and the pigtail 130. The epoxy 135 gradually diffuses until it permeates all the interface areas and therefore spreads over all interface-areas between the end surfaces of the short glass tubes 110 and 115 and all interface areas between the short glass tubes and the GRIN lens and the pigtail, significantly increasing bonding as compared with the prior art.

Then, as shown in Fig. 3B and described in column 5, lines 1-14, the fiber pigtail 130 is fixed to the glass tube 140 by heat curing epoxy 150, and the glass tube 140 is fixed to stainless steel holder 145 by epoxy 150.

The Examiner has cited Morooka as having a stub 3 with an optical fiber 1b inserted into one end of an inner hole of a precision sleeve 5. Note paragraph 22 describing the attachment. The sleeve 5 is fixed to the inner periphery of a sleeve case 6 by pressing fit or adhesion and the fiber stub 3 is fixed to the inner periphery of the holder 7. The sleeve case 6 is fitted to the holder 7, further. As discussed in the previous response, and as acknowledged by the Examiner, Morooka does not disclose fixing the stub 3 to the sleeve 5 through an adhesive. By contrast, in claim 1 the stub is required to be fixed to the inner hole of the precision sleeve through the adhesive. Further, the sleeve holder is fixed through the outer periphery of the precision sleeve by press fitting or through an adhesive.

Accordingly, in Zheng, because the distance and orientation of the fiber pigtail 130 relative to the GRIN lens 105 are aligned and adjusted until the lowest transmission loss is achieved, and then the GRIN lens 105, first short glass tube 110, fiber pigtail 130 and second

short glass tube 115 are then all fixed with each other, self alignment between the 'stub' 130 and the 'precision sleeve' 140 is not needed as in the present invention.

By contrast, in the present invention, the stub provided with the optical fiber is required to be positioned precisely at the center of the precision sleeve. The limitation of the stub and/or the inner hole of the precision sleeve having a surface roughness (Ra) value of 0.1 μm or more and 0.5 μm or less serves to precisely position the stub as explained above. Such is not necessary with Zheng, where a different alignment process takes place.

The Cited Reference to Morooka

The Examiner cites paragraph 36 of the translation of Morooka as teaching a surface roughness falling within the claimed range. This portion of Morooka discusses a roughness of the peripheral face of the of a ferrule 1a as desirably being 0.2 micrometers or less for "insertion nature." However, there is no indication that this has any applicability to the structure of Zheng and does not provide any reason to modify Zheng.

Moreover, neither Zheng nor Morooka provides the reason to have the stub and/or the inner hole of the precision sleeve with a surface roughness (Ra) value of 0.1 μm or more and 0.5 μm or less as precisely positioning the stub.

Neither Reference Discloses the Stub Fixed Only to an Inner Hole of the Precision Sleeve

The fact that the stub is recited in claim 1 as being fixed only to an inner hole of the precision sleeve emphasizes the need for precise alignment in the present invention. The need is not present in Zheng or identified in Morooka, as in part neither reference satisfies this limitation.

In Zheng, 'stub' 130 is fixed by epoxy to glass tube 115 and fixed by epoxy to 'precision sleeve' 140, and thus does not satisfy this limitation. In Morooka, as explained this previously, this limitation is also not satisfied. Nor would there be any reason to make such a modification in either references.

Thus, for this reason as well, claim 1 patentably defines over Zheng and Morooka.

Conclusion

The secondary references that have been cited by the Examiner, which have also been previously discussed, do not cure the deficiencies of Zheng and Morooka. Accordingly, it is respectfully submitted that all of the claims in the present application are clearly in condition for allowance and indication of such is respectfully requested.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance, and the Examiner is requested to pass the case to issue. If the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact Applicants' undersigned representative.

Respectfully submitted,

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